

Exhibit 17

1 UNITED STATES DISTRICT COURT
2 FOR THE NORTHERN DISTRICT OF OHIO
3 EASTERN DIVISION

4 IN RE: NATIONAL) MDL No. 2804
5 PRESCRIPTION OPIATE)
6 LITIGATION) Case No.
7) 1:17-MD-2804
8)
9 THIS DOCUMENT RELATES TO) Hon. Dan A.
10 ALL CASES) Polster
11)

12 Sunday, May 5, 2019

13 HIGHLY CONFIDENTIAL - SUBJECT TO FURTHER
14 CONFIDENTIALITY REVIEW
15

16 Videotaped Deposition of MEREDITH B.
17 ROSENTHAL, Ph.D., VOLUME 2, held at Robins
18 Kaplan LLP, 800 Boylston Street, Suite 2500,
19 Boston, Massachusetts, commencing at
20 8:04 a.m., on the above date, before
21 Michael E. Miller, Fellow of the Academy of
22 Professional Reporters, Registered Diplomate
23 Reporter, Certified Realtime Reporter and
24 Notary Public.

25 GOLKOW LITIGATION SERVICES
877.370.3377 ph | fax 917.591.5672
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<p style="text-align: right;">Page 202</p> <p>1 detailing versus the period right before 2 generic entry? 3 A. My model is an aggregate model, 4 so I'm looking across drugs in the entire 5 market, and those drugs are at different 6 stages in their life cycle. And so the 7 important input to my model is the level of 8 detailing, not where it is in the course of a 9 product's life cycle. 10 But we know that the bolus of 11 detailing happens for these new products, and 12 so that is incorporated into the data. 13 Q. So it's incorporated in the 14 sense that you'll see more contact at the 15 beginning of the life cycle than at the end 16 of the life cycle? 17 A. That's correct. 18 Q. But the detailing that happens 19 at the beginning of the life cycle could be 20 qualitatively different than the detailing 21 that happens at the end of the branded life 22 cycle. 23 Would you agree with that? 24 MR. SOBOL: Objection. 25 A. I don't know that to be true.</p>	<p style="text-align: right;">Page 204</p> <p>1 of does the detail generate more MMEs. 2 So for my purposes, I really 3 only want to understand does the detail 4 generate more MMEs. And again, because I'm 5 looking at the aggregate, the fact that some 6 drugs are ending and others are beginning, 7 that -- that sort of -- that mix, it may 8 change a little bit over time, but I'll be 9 looking across a set of drugs at different 10 stages. 11 Q. Okay. But what I described 12 might be relevant to the question of whether 13 the detailing was lawful, correct? 14 A. I don't know what you mean by 15 that. 16 Q. Right. So we've established 17 this, I think, but just to try it one more 18 time: Because your model is just focusing on 19 whether detailing impacts the aggregate 20 number of MMEs, you don't evaluate any 21 qualitative difference in the kind of 22 detailing that is occurring? 23 MR. SOBOL: Objection, asked 24 and answered. 25 ///</p>
<p style="text-align: right;">Page 203</p> <p>1 BY MR. ROTH: 2 Q. As an economist, I mean, when a 3 product is launched, you would expect more 4 detailing about clinical studies and things 5 designed to promote a new product that 6 physicians might be unaware of, right? 7 A. It may be that there is more of 8 that sort of baseline information at the 9 beginning. 10 Q. Right. And at the end of a 11 product's life cycle, when the generics are 12 about to come on the market, you might expect 13 the detailing to focus more on things like 14 price and availability and formulary status 15 and things of that nature, right? 16 A. I have seen no detailing 17 information that pertains to price. I can't 18 say that it never happens, but I've certainly 19 never seen that. 20 What that sort of -- what 21 you've just described here is on the one hand 22 saying, hey, there's this new drug early on, 23 and don't forget your old friend at the end, 24 something to that effect. Those -- those 25 differences are not relevant to the question</p>	<p style="text-align: right;">Page 205</p> <p>1 BY MR. ROTH: 2 Q. Is that a fair statement? 3 MR. SOBOL: Asked and answered. 4 A. I -- you had a "because" at the 5 beginning of that sentence, which doesn't 6 make sense to me. I am not looking at the 7 content of the detailing as we talked about 8 this morning. I am assuming the plaintiffs 9 will prove their case. 10 I understand that you think 11 differently and you're trying to probe 12 whether I've tried to disaggregate the 13 detailing. 14 I have not tried to 15 disaggregate the detailing by drug or over 16 time. It is possible to do that, but I have 17 not done that. 18 BY MR. ROTH: 19 Q. So in your direct model, just 20 like all MMEs are created equal, all 21 detailing contacts are created equal? 22 MR. SOBOL: Objection. 23 A. Again, I would acknowledge that 24 there's variation in detailing and that my 25 model captures the average effect.</p>

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1 BY MR. ROTH:
 2 Q. And it captures the average
 3 effect by treating each contact the same?
 4 MR. SOBOL: Objection.
 5 A. Well, I guess sort of an
 6 average effect means that sort of
 7 tautologically, I'm summing up all of the
 8 effects.
 9 BY MR. ROTH:
 10 Q. Does your model account for
 11 rivalrous marketing?
 12 A. I'm so happy that we've gotten
 13 back to this.
 14 MR. SOBOL: That makes one of
 15 us.
 16 A. The aggregate model that I put
 17 forth is intended to essentially obscure the
 18 rivalrous marketing, so to the extent that
 19 marketing only moves people from hydrocodone
 20 to oxycodone or the other direction, whatever
 21 it is, that will show up as a noneffect in my
 22 model.
 23 So I'm only looking at market
 24 expansion because the question I care about
 25 is market expansion.

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1 BY MR. ROTH:
 2 Q. I'm not sure I followed your
 3 answer. So how does it show up as a
 4 noneffect if you're including that contact in
 5 your regression analysis, whether it was new
 6 drug promotion or rivalrous marketing?
 7 A. I think the way you're looking
 8 at rivalrous marketing is a bit different
 9 than the way I would look at it. And this
 10 goes back to a conversation we had before
 11 where I think there was a little bit of a
 12 disconnect.
 13 So it may well be that you go
 14 to the detail and what you want to talk about
 15 is why you're better than the other guy. But
 16 still, what happens is you actually increase
 17 the use of any product in this class.
 18 So what I'm concerned about is
 19 not the intent of the marketing but the
 20 effect of the marketing. You seem focused on
 21 the intent.
 22 Q. I do. But now I think you've
 23 helped me, and your answer is actually the
 24 opposite of what I understood it to be
 25 before.

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1 When you say that rivalrous
 2 marketing is a noneffect, what you mean is
 3 you don't assess whether the marketing was
 4 rivalrous or not, because in either case,
 5 your view is it will potentially lead to
 6 increased MMEs, so it gets counted?
 7 MR. SOBOL: Objection, form,
 8 asked and answered.
 9 A. I am interested only in a
 10 particular kind of impact, and that impact is
 11 an increase in the number of MMEs. If there
 12 is marketing that changes the drug people
 13 take without affecting their MMEs, then I
 14 ignore that.
 15 Let's just say there's unlawful
 16 conduct and you earn money off of it, but
 17 it's really only because you've switched
 18 brands. That, I'm not counting, so that's a
 19 kind of rivalrous marketing effect that's not
 20 being counted in my impact assessment.
 21 I'm only concerned about market
 22 expansion by definition. Economists can be
 23 interested in both of those things, but for
 24 my purpose, I'm only interested in market
 25 expansion.

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1 BY MR. ROTH:
 2 Q. I'm just trying to understand
 3 functionally how that happens.
 4 So the reason you're saying
 5 that is because you're only looking at the
 6 delta, the change in MMEs, and so if there's
 7 no change, then the rivalrous marketing
 8 doesn't get counted? I'm just struggling
 9 with the mechanics.
 10 A. Sure. Let me try to explain.
 11 If we had two drugs in the
 12 market and we looked at their marketing
 13 separately, we could ascertain whether your
 14 marketing increases your sales, right, and --
 15 and then what we wouldn't know is, is that
 16 increase coming from new patients, or is it
 17 coming from the decrease in someone else's
 18 sales. So we could use a system kind of
 19 analysis to show what's happening.
 20 So people have done this in
 21 prescription drugs. I know you've spent some
 22 time with the literature, and they're curious
 23 about when you increase your sales, does it
 24 come at someone else's expense or are you
 25 just growing the market. And in different

<p style="text-align: right;">Page 210</p> <p>1 drug classes, those two things seem to 2 operate differently. 3 But if you were to add those 4 two drugs together and say, okay, for any 5 herpes treatment, what's the total effect of 6 marketing? Then what you would get is only 7 the market expansion effect. You would wash 8 out any of the market stealing because your 9 gain is my loss. And so those two things 10 would net out and you'd only get the net 11 result. So that's what I'm doing here. 12 Q. So the mechanics are because 13 it's an aggregate model that's aggregating 14 all contacts and aggregating all scripts, it 15 comes out in the wash if it's rivalrous? 16 A. Exactly. Rivalrous, again, my 17 definition of rivalrous is my sales come from 18 you and that those two things fully offset. 19 Q. Okay. But the detail itself is 20 still counted in the model, because you're 21 not actually looking substantively at the 22 detail to determine what happened? 23 MR. SOBOL: Objection. 24 A. That is correct. The detail is 25 still in the model, and where the rivalrous</p>	<p style="text-align: right;">Page 212</p> <p>1 turning points is that they -- that is 2 incorporating these many different events and 3 tactics. 4 Q. So the unbranded marketing is 5 captured by the way you do the breaks and the 6 way you test for these five events in 7 Model C, correct? 8 A. That's correct. 9 Q. But the unbranded marketing is 10 not captured in the detailing contacts you 11 use for your stock of promotion? 12 A. That's correct. 13 Q. How does your model account for 14 the peer-to-peer marketing that I think you 15 or Dr. Perri describes as a contagion 16 phenomenon in paragraph 25? 17 A. Yeah. So that phenomenon will 18 get picked up in marketing effectiveness, 19 because again, we're looking at aggregate 20 prescribing and not just the prescribing of 21 the targeted physicians. 22 So, you know, as -- we can go 23 back to our favorite paper by Datta and Dave, 24 they're looking at individual physicians. 25 It could well be, of course,</p>
<p style="text-align: right;">Page 211</p> <p>1 piece shows up is that it dampens the 2 effectiveness of marketing that we measure. 3 BY MR. ROTH: 4 Q. Okay. We're finally on the 5 same page then. 6 How does your model account for 7 unbranded marketing? 8 A. Well, in two ways. In Model C, 9 I explicitly put in some of those events. We 10 can look at exactly which ones they are. 11 Q. I was saving this for later, 12 but we can -- 13 A. I know, it sounds like an 14 after-lunch conversation, but the consensus 15 statement from the American Academy of Pain 16 Management and the American Pain Society, the 17 Federation of State Medical Boards 18 Guidelines, the JCAHO pain standards 19 released. 20 So these, I understand that 21 plaintiffs intend to prove they were 22 manipulated by the defendants. So I put 23 those explicitly in Model C. 24 And then as I describe Model B 25 and my rationale and the way I interpret the</p>	<p style="text-align: right;">Page 213</p> <p>1 detailing physician A causes physician B's 2 prescribing to increase; they're not really 3 looking at that because they're only looking 4 within physician. But we, for the same 5 reasons that I can capture market expansion 6 appropriately, aggregating up across doctors 7 here allows me to capture that contagion 8 effect. 9 Q. We do agree, though, that at an 10 individual prescriber, individual detail 11 visit level, there could be variation in the 12 impact that visit has? 13 A. There may be variation in the 14 impact of detailing on an individual 15 prescriber and her network and my model will 16 average that, will generate a result that 17 captures the average. 18 Q. And we talked a little bit 19 earlier about some of the variability in the 20 way detailing occurs. I think I used the 21 pizza example. 22 Do you remember that? 23 A. I remember pizza. 24 Q. Okay. I want to come back to 25 that for a minute maybe because it's</p>

<p style="text-align: right;">Page 214</p> <p>1 lunchtime.</p> <p>2 Not every detail visit occurs</p> <p>3 the same way in terms of time spent and what</p> <p>4 is disseminated from the pharmaceutical sales</p> <p>5 representative to the doctor, correct?</p> <p>6 MR. SOBOL: Objection, asked</p> <p>7 and answered.</p> <p>8 A. I would not disagree that</p> <p>9 details can be different day of the week,</p> <p>10 whether there's food involved, how much time.</p> <p>11 BY MR. ROTH:</p> <p>12 Q. And frankly, who is detailed,</p> <p>13 because it could be a prescribing doctor or</p> <p>14 it could be a nurse practitioner, it could be</p> <p>15 some other healthcare professional in the</p> <p>16 doctor's office, right?</p> <p>17 A. Yes, that's correct.</p> <p>18 Q. And does the IQVIA data you've</p> <p>19 looked at distinguish between the target of</p> <p>20 the detail?</p> <p>21 A. It distinguishes between</p> <p>22 office-based and hospital-based physicians,</p> <p>23 but it does not distinguish by licensure as</p> <p>24 you've just described.</p> <p>25 And again, what I'm interested</p>	<p style="text-align: right;">Page 216</p> <p>1 mean by simply. I think we're getting into a</p> <p>2 question about what and how will be proven to</p> <p>3 be unlawful. And if the question is was</p> <p>4 certain information omitted, then the fact</p> <p>5 that the information that was provided was in</p> <p>6 some way not challenged, to me, seems like it</p> <p>7 could still be a problem.</p> <p>8 But the larger issue is that I</p> <p>9 think it's not appropriate to try to pull</p> <p>10 these detail visits off one at a time. If</p> <p>11 there was some messaging around the utility</p> <p>12 of treating patients with opioids at an</p> <p>13 earlier visit and these later visits are just</p> <p>14 reminder visits, again, I'm not -- I'm not</p> <p>15 trying to prove liability here, but to me as</p> <p>16 an economist, it seems like they could well</p> <p>17 be connected.</p> <p>18 BY MR. ROTH:</p> <p>19 Q. And they all count the same way</p> <p>20 as the average?</p> <p>21 A. All -- all details in my data</p> <p>22 are included in the right-hand side, and they</p> <p>23 produce an average effect, and then I back</p> <p>24 out those particular ones deemed unlawful.</p> <p>25 Q. And similarly, if the detail is</p>
<p style="text-align: right;">Page 215</p> <p>1 in is the aggregate impact, and therefore,</p> <p>2 the average across that variation is</p> <p>3 appropriately subsumed in my analysis.</p> <p>4 Q. Right. And because you used</p> <p>5 the average, whether the sales rep makes</p> <p>6 contact with the prescribing doctor and</p> <p>7 spends 15 minutes discussing the virtues of</p> <p>8 opioids or whether the sales rep quickly</p> <p>9 speaks to a nurse practitioner to leave the</p> <p>10 coffee mug will get treated the same as an</p> <p>11 average in your model?</p> <p>12 A. Yes. And that is appropriate</p> <p>13 if you're interested in the aggregate effect.</p> <p>14 If I were interested in comparing the</p> <p>15 difference between a detail with pizza versus</p> <p>16 a detail without pizza, then I would want to</p> <p>17 look at them. But I'm only interested in the</p> <p>18 aggregate effect.</p> <p>19 Q. Are you aware that detailing</p> <p>20 could be limited to simply providing</p> <p>21 literature that contains information</p> <p>22 contained in the package insert or approved</p> <p>23 by the FDA in promotional materials?</p> <p>24 MR. SOBOL: Objection.</p> <p>25 A. I'm not exactly sure what you</p>	<p style="text-align: right;">Page 217</p> <p>1 corrective messaging designed to dampen the</p> <p>2 effects of some prior materials that FDA has</p> <p>3 issued a warning letter on, those detail</p> <p>4 visits get picked up by your data as well?</p> <p>5 MR. SOBOL: Objection.</p> <p>6 A. I think you need to understand</p> <p>7 what the regression is doing. It is not just</p> <p>8 saying sales are strictly promotional to</p> <p>9 detailing. It's trying to look at that</p> <p>10 effect, and, in fact, in the last period of</p> <p>11 my three-period model, the effective</p> <p>12 promotion is declining.</p> <p>13 To the extent that there's</p> <p>14 corrective messaging, that may be one of the</p> <p>15 factors that is decreasing the effectiveness</p> <p>16 of promotion, and so there are not MMEs</p> <p>17 assigned to have been produced by that</p> <p>18 detail.</p> <p>19 BY MR. ROTH:</p> <p>20 Q. Let me just ask a simpler</p> <p>21 question: Yes or no, are details that are</p> <p>22 simply designed to provide corrective</p> <p>23 messaging included in your stock of</p> <p>24 promotion?</p> <p>25 MR. SOBOL: Objection, asked</p>

<p style="text-align: right;">Page 218</p> <p>1 and answered.</p> <p>2 A. I really have no idea about</p> <p>3 whether such details exist. My model</p> <p>4 includes all detailing over the period from</p> <p>5 1995 to 2018 based on the instruction that I</p> <p>6 was given to consider that unlawful.</p> <p>7 BY MR. ROTH:</p> <p>8 Q. Okay. Without distinguishing</p> <p>9 between the quality or extent of those</p> <p>10 detailing visits?</p> <p>11 MR. SOBOL: Objection, asked</p> <p>12 and answered.</p> <p>13 A. I do not distinguish among</p> <p>14 those details, no.</p> <p>15 BY MR. ROTH:</p> <p>16 Q. And I think we talked about</p> <p>17 this, but I'm not sure.</p> <p>18 You don't differentiate between</p> <p>19 which physician practice groups were targeted</p> <p>20 by the details in your model?</p> <p>21 MR. SOBOL: Objection, asked</p> <p>22 and answered.</p> <p>23 A. As I noted, my detailing</p> <p>24 measure is national. It's aggregate. It</p> <p>25 does not distinguish at a level below that.</p>	<p style="text-align: right;">Page 220</p> <p>1 A. I am, as we've noted earlier,</p> <p>2 operating on the assumption that the</p> <p>3 defendants' conduct during the relevant</p> <p>4 period was unlawful, and my model uses a</p> <p>5 single measure of detailing and therefore</p> <p>6 averages across allegedly lawful and unlawful</p> <p>7 details.</p> <p>8 BY MR. ROTH:</p> <p>9 Q. Let's look back at Datta and</p> <p>10 Dave because you asked to.</p> <p>11 A. Okay.</p> <p>12 Q. It's Exhibit 5, for the record,</p> <p>13 and I -- can you turn with me to page 454.</p> <p>14 A. Okay.</p> <p>15 Q. So at the top of the page it</p> <p>16 says: Thus, detailing plays a role in</p> <p>17 educating providers about newer drugs and</p> <p>18 their attributes and may have information</p> <p>19 value early in a product's life cycle,</p> <p>20 whereas later in the life cycle, its role can</p> <p>21 be predominantly persuasive and chiefly</p> <p>22 relegated to delivering samples and</p> <p>23 reminders.</p> <p>24 Do you see that?</p> <p>25 A. I do.</p>
<p style="text-align: right;">Page 219</p> <p>1 BY MR. ROTH:</p> <p>2 Q. Do you have any view as to</p> <p>3 whether allegedly deceptive marketing is more</p> <p>4 impactful than truthful marketing?</p> <p>5 A. I think I do discuss this in my</p> <p>6 report, and there's an economic theory</p> <p>7 related to the profitability of fraud and</p> <p>8 some evidence from other sectors that suggest</p> <p>9 that for something unlawful to be undertaken</p> <p>10 when lawful activities are possible, that it</p> <p>11 must be more profitable because there's some</p> <p>12 cost associated with matters such as this</p> <p>13 one. And so that would suggest that that</p> <p>14 kind of marketing must be more profitable</p> <p>15 than marketing to other physicians.</p> <p>16 I think this is -- it depends</p> <p>17 on what assumptions we're making about the</p> <p>18 intention and knowledge of the various</p> <p>19 actors. So I think it could go either way.</p> <p>20 Q. But within your model, within</p> <p>21 the time periods of your model, you treat</p> <p>22 each of the details equally because in your</p> <p>23 view, you assume them all to be equally</p> <p>24 unlawful at this point in time?</p> <p>25 MR. SOBOL: Objection.</p>	<p style="text-align: right;">Page 221</p> <p>1 Q. And then at the end of the</p> <p>2 paragraph, they say: Because detailing can</p> <p>3 affect both selective (brand centric) and</p> <p>4 primary (market) demand under these views --</p> <p>5 citation to Dave and Kelly, 2014 -- the</p> <p>6 question cannot be resolved based on theory</p> <p>7 alone, and empirical evidence needs to bear</p> <p>8 upon the question.</p> <p>9 Do you see that?</p> <p>10 A. Yes. Just to be clear, what</p> <p>11 they're talking about there is the welfare</p> <p>12 effects of marketing, and that is a separate</p> <p>13 question than the one that we're discussing</p> <p>14 here.</p> <p>15 Q. It's the same issue that we've</p> <p>16 been going around on, right? You're not</p> <p>17 looking at the welfare, you're not looking at</p> <p>18 the quality; you're just looking to see if</p> <p>19 there's a correlation between detailing</p> <p>20 visits as a stock of promotion against</p> <p>21 MMEs --</p> <p>22 MR. SOBOL: Objection, asked</p> <p>23 and answered.</p> <p>24 BY MR. ROTH:</p> <p>25 Q. -- on an aggregate basis.</p>

<p style="text-align: right;">Page 222</p> <p>1 MR. SOBOL: And there's a lot</p> <p>2 in there, so be careful.</p> <p>3 A. I just want to say that the</p> <p>4 sentence that you just said had a number of</p> <p>5 pieces that I think are entirely unrelated to</p> <p>6 one another.</p> <p>7 So a welfare analysis is -- is</p> <p>8 an economic analysis that is based on the</p> <p>9 theory of demand and is -- is specific to</p> <p>10 this idea that consumers make rational</p> <p>11 decisions, so what he's talking about in this</p> <p>12 sentence really has nothing to do with this</p> <p>13 question about the quality of detailing or</p> <p>14 not.</p> <p>15 That sentence is not connected</p> <p>16 to the "thus detailing plays a role in</p> <p>17 educating providers." They have a marketing</p> <p>18 theory that you related before about what</p> <p>19 happens early versus late in the life cycle,</p> <p>20 but this last sentence is really just about</p> <p>21 are consumers better off because of</p> <p>22 promotion, or not.</p> <p>23 And the way economists do a</p> <p>24 welfare analysis like this one is to assume</p> <p>25 that consumers are perfectly informed and</p>	<p style="text-align: right;">Page 224</p> <p>1 about whether that generates more sales at</p> <p>2 the beginning or more sales at the end.</p> <p>3 There again, they're really</p> <p>4 focused on this are you getting a new unit</p> <p>5 from a patient who hasn't been treated versus</p> <p>6 a new unit from a rival.</p> <p>7 Q. Got it.</p> <p>8 MR. ROTH: I think now is a</p> <p>9 decent time to take lunch.</p> <p>10 THE WITNESS: Okay.</p> <p>11 THE VIDEOGRAPHER: The time is</p> <p>12 12:09 p.m. We're now off the record.</p> <p>13 (Recess taken, 12:09 p.m. to</p> <p>14 12:51 p.m.)</p> <p>15 THE VIDEOGRAPHER: The time is</p> <p>16 12:51 p.m. We're back on the record.</p> <p>17 BY MR. ROTH:</p> <p>18 Q. Professor Rosenthal, before</p> <p>19 lunch we were talking about how your stock of</p> <p>20 promotion just includes detailing visits</p> <p>21 multiplied by a coefficient as a single</p> <p>22 variable; is that correct?</p> <p>23 A. Just to be perfectly clear,</p> <p>24 it's a cumulative sum of detailing in one</p> <p>25 period -- all the preceding periods with the</p>
<p style="text-align: right;">Page 223</p> <p>1 perfectly rational and that if marketing is</p> <p>2 only about stealing market share and it</p> <p>3 doesn't increase the size of the market, that</p> <p>4 consumers are worse off. But if it does</p> <p>5 increase the size of the market, that</p> <p>6 consumers are better off.</p> <p>7 As a health economist and a</p> <p>8 person who sits in the School of Public</p> <p>9 Health, I would like to say that if this</p> <p>10 marketing was only about market expansion, as</p> <p>11 it seems to have been quite a bit about</p> <p>12 market expansion, I don't think consumers are</p> <p>13 better off as a result. They're just</p> <p>14 operating from a totally different framework.</p> <p>15 BY MR. ROTH:</p> <p>16 Q. Okay. Let's go back to the</p> <p>17 first sentence, which I think was more</p> <p>18 relevant.</p> <p>19 They theorized that based on</p> <p>20 their results, there is a difference between</p> <p>21 marketing early in the life cycle and</p> <p>22 marketing later in the life cycle?</p> <p>23 A. They are positing a theory</p> <p>24 about the intent of marketing and the focus</p> <p>25 of marketing, but they do not say anything</p>	<p style="text-align: right;">Page 225</p> <p>1 depreciation rate applied.</p> <p>2 Q. Are you aware that there are</p> <p>3 other economic studies of the effect of</p> <p>4 marketing that model detailing using multiple</p> <p>5 variables?</p> <p>6 A. I know that detailing has been</p> <p>7 modeled as both a stock and a flow, and both</p> <p>8 at the same time. I don't know if that's to</p> <p>9 what you're referring.</p> <p>10 Q. It may be.</p> <p>11 (Whereupon, Deposition Exhibit</p> <p>12 Rosenthal-7, 2002 Azoulay Publication,</p> <p>13 was marked for identification.)</p> <p>14 BY MR. ROTH:</p> <p>15 Q. So let me mark as Exhibit 7 the</p> <p>16 Azoulay study, Do Pharmaceutical Sales</p> <p>17 Respond to Scientific Evidence.</p> <p>18 Do you have that in front of</p> <p>19 you?</p> <p>20 A. I do.</p> <p>21 Q. And the Azoulay study is a</p> <p>22 document that I think you quote from and --</p> <p>23 in your report and rely on in your</p> <p>24 attachment.</p> <p>25 A. That's correct.</p>

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1 A. Yes.
 2 Q. There's a patch, right?
 3 A. Yes.
 4 Q. There's that sublingual spray?
 5 A. Yes.
 6 Q. And then there's pills and
 7 injectables, for example?
 8 A. Yes.
 9 MR. SOBOL: Film.
 10 BY MR. ROTH:
 11 Q. Film?
 12 A. Yes, I'm aware that there are
 13 different formulations.
 14 Q. And there's also
 15 immediate-release opioids and
 16 extended-release opioids, correct?
 17 A. Yes, that's correct.
 18 Q. And for the purpose of your
 19 models, apart from the injectables, all of
 20 those various forms of opioids are included?
 21 A. Yes, that's correct.
 22 Q. Did the manufacturers'
 23 marketing budgets that you reviewed show
 24 increased marketing spending over time?
 25 A. As I sit here, I don't recall.

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1 Q. Would you agree that if the
 2 depreciation rate augments the stock of
 3 detailing over time, it would be irrational
 4 to keep spending money on promotion?
 5 MR. SOBOL: Objection.
 6 A. No, I don't think that that
 7 would be a conclusion that I would agree
 8 with.
 9 BY MR. ROTH:
 10 Q. And why not?
 11 A. The more effective your
 12 marketing is, the more you want to spend on
 13 it.
 14 MR. SOBOL: An answer I
 15 understood.
 16 BY MR. ROTH:
 17 Q. We spoke briefly about your
 18 errata yesterday. Can you just tell me how
 19 did that errata come about?
 20 A. That came about from review
 21 partly, my very careful review as I was
 22 preparing for this deposition, and the staff
 23 doing the same.
 24 Q. Got it.
 25 And then why did it come in the

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1 form of a memo from Mr. McCluer to you and
 2 Mr. Sobol?
 3 A. I'm not sure I can answer that
 4 question.
 5 Q. But it sounds like the errors
 6 were identified some by you and some by the
 7 staff?
 8 A. Yes, that's correct.
 9 Q. Do you know who caught the
 10 Table 3 error?
 11 A. That was me.
 12 Q. I feel bad for the staff on
 13 that one. And what about the --
 14 A. I'm not the yelling type.
 15 Q. And what about the statistical
 16 significance error, was that you or the
 17 staff?
 18 A. That was the staff.
 19 Q. Let's turn to your indirect
 20 model.
 21 A. Okay.
 22 Q. So you talk about your indirect
 23 model beginning at paragraph 78 of your
 24 report.
 25 And I guess just taking a step

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1 back before we get into specifics: Do you
 2 have a preference for your direct over your
 3 indirect model in this case?
 4 A. I believe they have strengths.
 5 Each of them has strengths, so in my
 6 opinions, I have not favored one over the
 7 other.
 8 Q. In general when you perform
 9 regression analysis, do you have any
 10 preference for a direct approach versus an
 11 indirect approach?
 12 A. No preference. I think these
 13 kinds of models are really context specific.
 14 Q. And if you look at page 53,
 15 paragraph 78, you start by saying: As noted
 16 earlier, the direct method of estimation is
 17 limited in part by the extent to which we can
 18 measure and include in the models all of the
 19 tactics allegedly employed by defendants,
 20 including manipulation of various
 21 professional societies and accrediting
 22 bodies.
 23 Did I read that correctly?
 24 A. Yes, you did.
 25 Q. And that's based on the

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1 allegations that you reviewed?

2 A. That's correct.

3 Q. Would you agree that if a

4 defendant did not engage in promotion other

5 than the detailing measured by the IPS data,

6 the direct model would be a more appropriate

7 measure of that particular defendant's impact

8 on the aggregate MMEs?

9 A. My assignment was to calculate

10 aggregate impact, so I have not considered

11 how to calculate impact for a single

12 defendant.

13 As we talked about yesterday, I

14 think there are some complicated questions

15 about how to deal with the spillover effect,

16 so I have not undertaken to do that.

17 Q. As we've discussed fairly

18 exhaustively, your direct Model B explains

19 over 99% of the variation in MME sales based

20 on the detailing data in IQVIA.

21 A. Yes, it does.

22 Q. Does that not suggest that the

23 effect of all of these other types of

24 promotion is negligible at best?

25 A. It may well be the case that

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1 the amount of variation that is picked up by

2 a broader measure of promotion would not be

3 so much more. The indirect model is

4 conceptually quite different, however.

5 Q. So if you compare Table 5,

6 which is on page 61 -- let's take a step

7 back, lay some foundation.

8 A. Sure.

9 Q. So Table 5 on page 61 is the

10 output of your indirect model, correct?

11 A. It is.

12 Q. Okay. We talked yesterday

13 about Table 2, which is the output of your

14 direct model and appears on page --

15 A. Should I bend the corner so we

16 can go back and forth?

17 Q. Yes, good idea.

18 So I want to compare the direct

19 output in Table 5 on page 61 -- sorry, strike

20 that.

21 I want to compare the indirect

22 model output in Table 5 on page 61 with the

23 direct model output in Table 2 on page 51.

24 A. Okay.

25 MR. SOBOL: Do we have a graph

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1 of this somewhere?

2 THE WITNESS: Not in my report.

3 MR. ROTH: Just for you. I

4 don't think we've seen that. I would

5 love to see it.

6 BY MR. ROTH:

7 Q. So looking at the two tables

8 next to each other, I guess just first taking

9 the bottom line, in Table 2, the direct Model

10 B estimates that [REDACTED] of MMEs are

11 attributable to defendants' detailing.

12 Do you see that?

13 A. Yes.

14 Q. And in Table 5, the indirect

15 method suggests that [REDACTED] of MME shipments are

16 attributable to defendants' detailing; is

17 that right?

18 A. That's correct.

19 Q. So that's a [REDACTED] delta -- well,

20 that's a bad question because that's not how

21 math works.

22 MR. SOBOL: Right.

23 BY MR. ROTH:

24 Q. It's [REDACTED] higher -- well, the

25 numbers are what they are, but it's [REDACTED]

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1 and [REDACTED] -- it's actually [REDACTED] higher, I think,

2 if I'm doing the math right.

3 A. It is [REDACTED] percentage points or

4 about [REDACTED] higher than the direct estimate.

5 Q. You said it better than I

6 could.

7 How is that possible given that

8 you had a 99% R-squared in the direct model

9 that your indirect model could estimate twice

10 as much impact by defendants' promotion?

11 A. As I mentioned, they are

12 conceptually very different kinds of

13 analyses, so whether or not detailing

14 explains the vast majority of the variation

15 in sales, it does not account for -- it

16 accounts for a smaller percentage of total

17 sales, so the magnitude of effect is not the

18 same thing as the amount of variation

19 explained, right?

20 And the indirect model takes

21 the position that there are these long run

22 factors that may -- that we can see are

23 relevant to demand in -- across areas, and if

24 we extend those forward, looking at the

25 growth in MMEs only as a result of those

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1 factors, that's another version of what the
 2 world would have been like.
 3 Q. It assumes, again, that the
 4 drivers of the massive growth we saw were
 5 only related to defendant promotion, and so
 6 it allows defendant promotion to affect sales
 7 in a broader way than the direct model does.
 8 Q. In the direct model, I believe
 9 you went through 2018; is that right?
 10 A. Yes. There were differences in
 11 data availability, so yes.
 12 Q. Right. So that was what I was
 13 going to ask you.
 14 Direct goes through 2018,
 15 indirect only goes through 2016?
 16 A. Yes. And as I'm sure we'll get
 17 to also, because the ARCOS data start in
 18 1997, I do, I backcast for '95 and '96, but
 19 really I'm starting in 1997.
 20 Q. Got it. So direct, you go '95
 21 to 2018; indirect, you go from '97 to 2016.
 22 A. That's correct.
 23 Q. Okay. And that's just because
 24 of just data limitations?
 25 A. That's correct.

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1 Q. If you had the other years, you
 2 would use them in the indirect model?
 3 A. That's correct.
 4 Q. If you look at paragraph 82 of
 5 your report, you describe your indirect model
 6 as a form of residual analysis.
 7 Do you see that?
 8 A. Yes.
 9 Q. And can you explain what a
 10 residual analysis is?
 11 A. Well, a residual is the
 12 leftover part, and so a residual analysis is
 13 an analysis that draws inferences not from
 14 something included, but something excluded.
 15 Q. Sort of like in accounting,
 16 when you depreciate something, what's left
 17 after you've depreciated it is the residual?
 18 A. Is it? Yeah, perhaps.
 19 Q. Except if the depreciation
 20 somehow appreciates, but we won't go there
 21 again.
 22 What is the baseline of your
 23 indirect model?
 24 A. The baseline for the indirect
 25 model as I just mentioned is the 1997 level

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1 of MMEs.
 2 Q. And you chose that because that
 3 was the earliest year available in ARCOS?
 4 A. Yes, that's correct.
 5 Q. How did you construct the
 6 explanatory variables you used in the
 7 indirect model?
 8 A. The explanatory variables come
 9 from a variety of sources that I think we
 10 reviewed at a very high level yesterday.
 11 They're county level -- we haven't exactly
 12 talked about. So this is a county level
 13 cross-sectional analysis and we bring in data
 14 from a variety of government economic sources
 15 and other sources to capture county-level
 16 information.
 17 Q. And we spoke about this a
 18 little yesterday with respect to Professor
 19 Cutler.
 20 A. Yes.
 21 Q. But the same question for you:
 22 Why did you decide to use national data and
 23 do a national model for direct regression,
 24 but then do your indirect regression analysis
 25 based on county-level data?

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1 MR. SOBOL: Objection, asked
 2 and answered.
 3 A. Sure. The time series analysis
 4 that I did is appropriately done at the
 5 national level. We're trying to calculate
 6 national aggregate impact and the factors
 7 that drive sales over time make sense to do
 8 in -- at a national level there. We don't
 9 have promotional data at a county level, so
 10 it would not be possible to do a direct model
 11 at this level.
 12 On the other hand, and this is
 13 why the indirect model complements the direct
 14 model, we can look cross-sectionally at
 15 variation in these socioeconomic and
 16 demographic variables because there's a fair
 17 amount of cross-sectional variation, and get
 18 reasonably precise estimates of the effect of
 19 those factors on MMEs.
 20 And so the cross-sectional
 21 model works at the county level, and then
 22 rather than having to estimate the effects of
 23 those variables over time, we can trend them
 24 forward based on the cross-sectional
 25 analysis.